

MESSAGE FROM THE DIRECTOR

Dear Smart Manufacturing Community,

We started 2025 with a lot of new enthusiasm and fresh spirit as two new team members joined us. I would like to introduce Anshu Bahadur, who joined us as Sr. Program Manager for Smart Manufacturing (SM) community and Rafael Tudela, who as Sr. Technical Marketing Manager will be supporting Technology Communities. Below is a brief introduction to both. Please join me in welcoming to the SM community.

Anshu Bahadur

Anshu Bahadur joined SEMI in early February to manage Technical Communities for Smart Manufacturing. His role will focus on developing the vision for Industry 5.0 and the role of AI frameworks in Semiconductor manufacturing (including Digital Twins, and Agentic AI). He will also assist in building partnerships with other groups & companies to drive development & sharing of common data standards & frameworks.

Before joining SEMI, Anshu worked for Deloitte, Cognizant and advised key semiconductor & high-tech clients like NIST/Department of Commerce, Qorvo, LAM Research, KLA & Cisco. He started his career in semiconductor manufacturing and spent the early part of his career at Sematech, Motorola & Intel.

Rafael Tudela

Rafael Tudela joined the SEMI Corporate Marketing team at the beginning of this month. His focus will be on technical marketing for the Smart initiatives, and technical working communities.

In his previous role Rafael focused on developing high volume manufacturing capabilities of FHE devices. He not only developed R2R manufacturing processes, but also advocated FHE manufacturing to customers, partners, and prospects. Rafael's background is in Electrical and Electronics engineering with an emphasis in sustainable graduating from the University of Georgia.

CHAPTER NEWS

We had a very active Q1 2025 and would like to share the highlights from our Chapter meetings.

- In January, we had **Lavorro** presenting AI/ML Powered Solutions for Accelerating Performance and Productivity in Semiconductor Manufacturing
- In February, we had a presentation by **Porsche Consulting** on the SEMI Europe 2024 Smart Manufacturing Report
- In March, **Dassault Systèmes** made a presentation on AI-Driven Innovation in Semiconductor Engineering

TECHNOLOGY SPOTLIGHTS

Lavorro: AI/ML Powered Solutions for Accelerating Performance and Productivity in Semiconductor Manufacturing (Jan '25)

Semiconductor manufacturing is rapidly evolving, yet fabs face significant challenges: workforce skill gaps, slow issue resolution, knowledge loss, and optimizing OEE. As processes grow complex, traditional methods lag behind.

Fabs must integrate extensive operational and equipment data with advanced AI technologies. Modern solutions must replace static documentation and siloed systems with real-time knowledge synthesis, cognitive offloading, and AI-driven decision support. Engineers need integrated access to actionable insights within operational workflows.

Lavorro meets these needs through its AI-powered suite, combining Large Language Models (LLMs) with expert knowledge graphs. It transforms fab data into actionable knowledge via intuitive infinite canvas workspaces, concurrent data visualization, and AI-generated insights. With secure on-premises and cloud deployment, Lavorro accelerates issue resolution, reduces skill gaps, supports continuous improvement, and safeguards intellectual property.

Porsche Consulting: SEMI Europe 2024 Smart Manufacturing Report Released (Feb '25)

In today's competitive semiconductor landscape, Western companies must not only boost performance but also overcome talent shortages while maintaining cost efficiency. Smart manufacturing is a key enabler for achieving these goals and securing a sustainable competitive advantage.

However, the adoption of smart manufacturing often faces challenges, including partial ROI and complex implementation. The Smart Manufacturing Report 2024, developed by **SEMI Europe's e2e Smart Manufacturing Community** with support from **Porsche Consulting**, addresses these hurdles. The report delves into smart manufacturing applications, market needs, and challenges, backed by real-world use cases, insights from SEMI partners.

Download Your Copy

Dassault Systèmes: AI-Driven Innovation in Semiconductor Engineering (March '25)

The semiconductor industry faces unprecedented complexity as technology nodes transition to angstrom-scale features. Traditional design methods are reaching diminishing returns, demanding AI-driven approaches for co-optimization across devices, packaging, and manufacturing to optimize new products for power, performance, area, cost, and sustainability.

Virtual twin modeling and simulation, integrated within a model-based systems engineering (MBSE) framework, enable domain experts to break down silos and tackle these challenges holistically. AI accelerates materials simulations, optimizes process recipes, and enhances context-aware design.

Dassault Systèmes' SEMI UNIV+RSE, powered by the 3DEXPERIENCE Platform, provides a multi-physics suite of tools for AI-driven semiconductor design and manufacturing. By embedding these advanced methodologies into workflows and immersive workforce experiences in-situ, as demonstrated by our breakthrough work with Purdue University, enterprises can democratize access to expert knowledge and know-how, empower engineers with proven best practices, foster true experiential collaboration, and manage their IP generation from lab-to-fab.

SEMICON Japan Event Highlights

SEMICON Japan hosted a Smart Factory session on Surface Mount Technology & Robotics Technology Toward 2030. The session was well attended with around 80 attendees. The following presenters & companies presented their innovations.

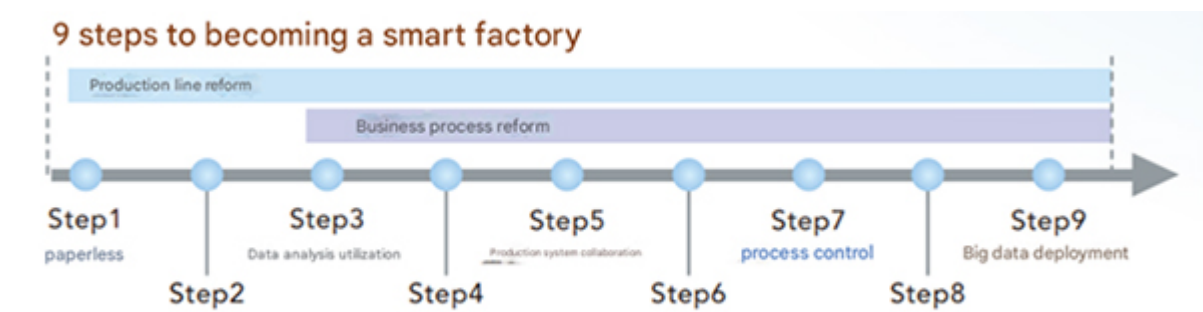
- Osamu Ono (Sanken Electric) - Efforts of the Sanken Smart Factory
- Kazuhiro Kobayashi (Yamaha) - The future of automation that YAMAHA Robotics is aiming for - Perfect Fit Automation
- Yasuhisa Aono (Panasonic Connect) - Edge Devices and Automation and Intelligence to Realize Autonomous Factories

Sanken Electric

Sanken Electric has established a detailed nine-step roadmap designed to transition its production facilities into advanced smart factories, emphasizing comprehensive data collection, storage, and utilization. The roadmap begins with digitizing processes and automating data collection, swiftly progressing toward deploying automation technologies such as Automated Guided Vehicles (AGVs) and robotics for enhanced efficiency. Advanced stages of the roadmap introduce sophisticated process control, predictive forecasting capabilities, autonomous production flows, and the strategic use of big data analytics. This structured progression is aimed at significantly boosting productivity, ensuring higher quality standards, and reducing operational costs.

More information about each step and a visual is presented below.

Stage	Definition	Initiatives
Step 1	Paperless	Digitalization of paper-based processes, data input, and forms.
Step 2	Equipment Data Collection	Equipment data collection and visualization (IoT sensors, 4G/5G connectivity).
Step 3	Data Analysis and Utilization	Data analysis and value extraction for operational improvements.
Step 4	Automation	Enhanced automation through autonomous guided vehicles (AGV) and advanced robotics.
Step 5	Production System Integration	Data output to external systems and leveraging for optimized use.
Step 6	Prediction and Forecasting	Demand forecasting and predictive maintenance; real-time system analysis and feedback.
Step 7	Process Control	Line control and operation instructions.
Step 8	Automated Workflow	LOT elimination, granular management control.
Step 9	Big Data Deployment	Integration of on-site big data with other systems (IoT), production line optimization, process innovation, DX (digital transformation), and predictive maintenance.

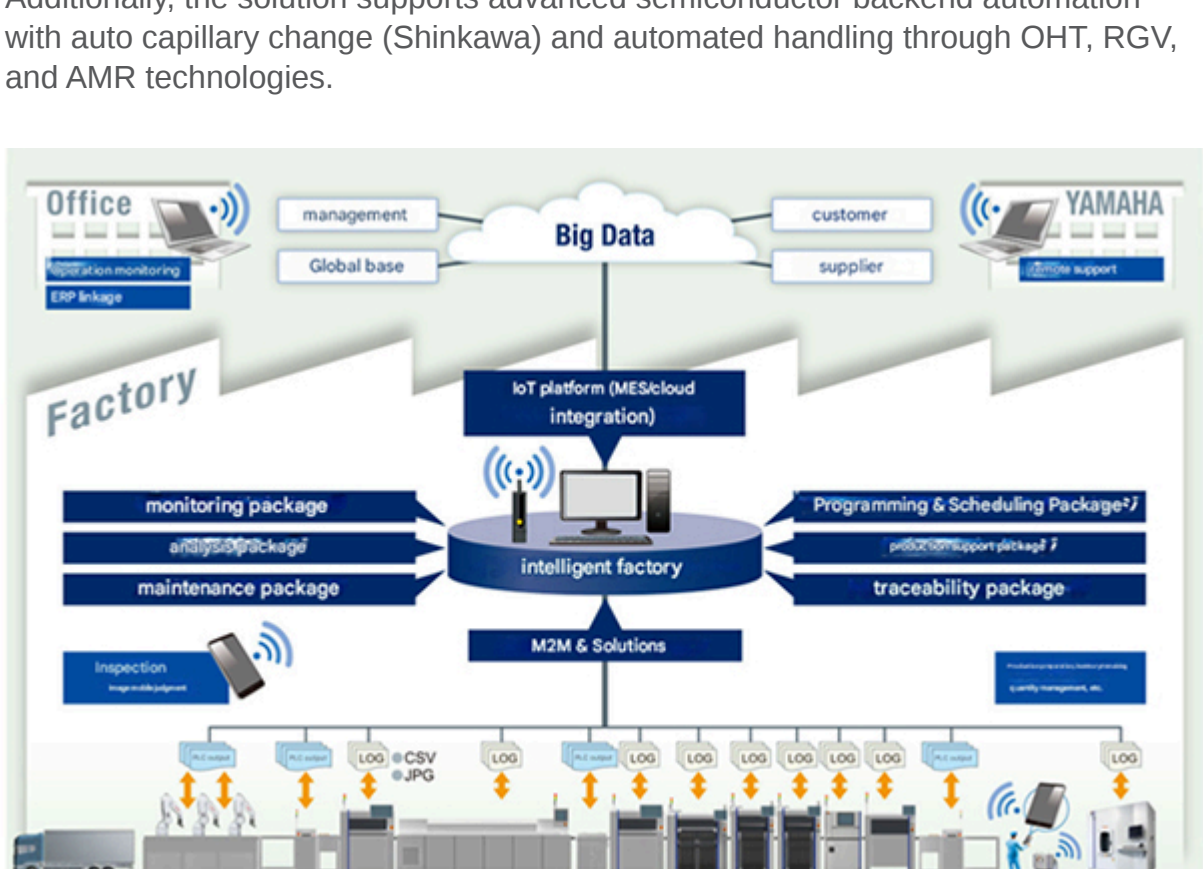


Yamaha Perfect Fit Automation

Yamaha introduced the Perfect Fit Automation concept, tailored specifically to customer factory requirements. It features batch automatic setup for the first machine, autoloading feeders with pre-set standby reels, SPI/AOI collaboration, dashboards, self-adjustment, and auto-recovery capabilities.

The integrated solution includes an Automation Mounter for automatic component replenishment, a Delivery Station that pre-stores and retrieves feeders, and a Changer to handle feeder transport and exchange. These innovations automate labor-intensive replenishment tasks on SMT production floors, ensuring continuous operation without delays.

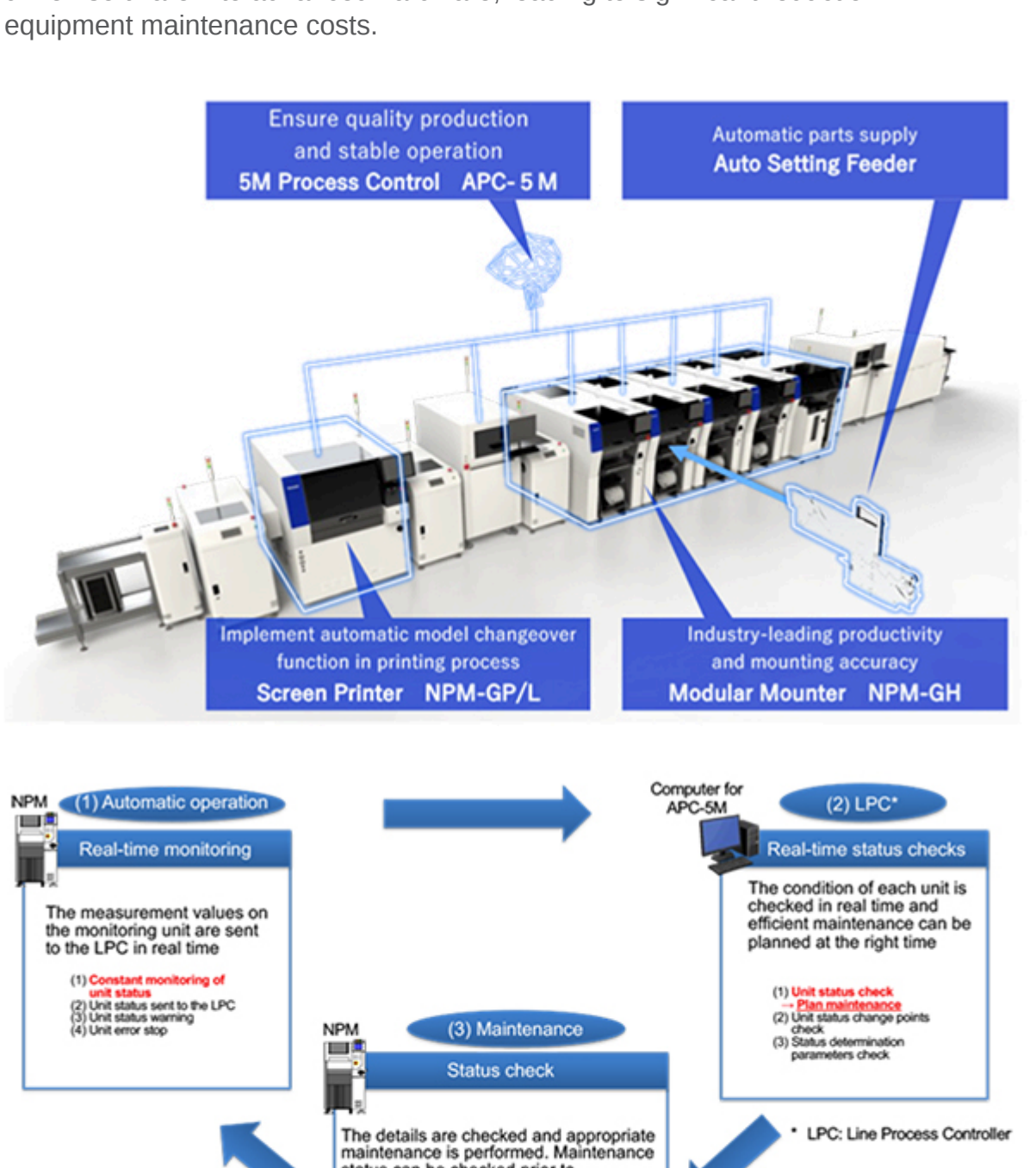
Additionally, the solution supports advanced semiconductor backend automation with auto capillary change (Shinkawa) and automated handling through OHT, RGV, and AMR technologies.



Panasonic Connect

Panasonic Connect brings Edge AI into SMT equipment automation. They presented APC-5M, their advanced process control system that provides real-time monitoring and analysis of the five production factors or 5Ms: Man, Machine, Material, Method, and Measurement. It monitors irregularities in the 5Ms in real time and detects production line changes. It analyzes the accumulated data, identifies the cause, and uses empirical data to autonomously solve the problem.

Panasonic Connect also has offerings for the semiconductor industry, integrating AI driven software into advanced hardware, leading to significant reduction in equipment maintenance costs.



Looking Ahead

We have an exciting year ahead planned for our SM community. It starts with Smart Manufacturing Expo in the Heartland April 1-2, followed by a two-day workshop June 11-12 on 'Agentic AI in Semiconductor Manufacturing', June 11-12, 2025. SEMICON West this year is in Phoenix October 7-9, 2025.

Besides these events we have exciting webinars, presentations and white papers planned for our community. So, stay tuned!

Warm regards,

Mark da Silva, Ph.D.
Senior Director – Smart Manufacturing, SEMI
mdasilva@semi.org
[Linked In](#)

SEMI UNIVERSITY SMART MANUFACTURING COURSES

Check out the newest addition of Smart Manufacturing courses to SEMI University. SEMI's online learning platform.

- Automation Basics
- Internet of Things: Manufacturing
- Robotics Fundamentals
- Sensors: Measurement Concepts

FEATURED ARTICLES

SEMI News

Sustainable AI Systems for Energy-Efficient Computing

III-V: A New Era of Technological Advances

Podcast Interviews: Business and Market Perspectives from SEMI's Industry Strategy Symposium

Technology News

Multi-Die Design Complicates Data Management

Unlocking New Possibilities in AI with Unity-SC: Insights from Merck KGaA, Darmstadt, Germany's Kai Beckmann

MEMBER SUCCESS STORY: POLAR SEMICONDUCTOR

From navigating the CHIPS Act to fostering innovation through collaboration, SEMI-Polar success story underscores the transformative power of deeper engagement and collective action. Read the full story to explore how Polar Semiconductor leverages SEMI initiatives and capabilities to enhance technological capabilities, build strategic partnerships, and expand its market influence.



UPCOMING EVENTS



SEMIEXPO HEARTLAND 2025 | April 1-2, 2025 | Indianapolis, IN

Join us for a groundbreaking inaugural Midwest conference and tradeshow focused on Smart Manufacturing and Smart Mobility with an emphasis on the Assembly, Package & Test (APT) areas of semiconductor manufacturing

Sessions will focus on:

- Assembly, Package & Test Innovations Unleashed
- Smart Manufacturing for Assembly, Package & Test (APT): Data Analytics/AI & Digital Twins
- Robotics & Automation for APT
- Future OSAT and APT Factories

Register Today



ASMC
ADVANCED SEMICONDUCTOR MANUFACTURING CONFERENCE
MAY 5-8, 2025
ALBANY, NY

Connect with top minds in semiconductor manufacturing at the 36th **Advanced Semiconductor Manufacturing Conference—ASMC**, where industry leaders, suppliers, and researchers come together to network and learn the latest in the practical application of advanced manufacturing strategies and methodologies.



Smart Manufacturing Workshop | June 11-12 | Milpitas, CA

Discover how Agentic AI—autonomous AI systems that make data-driven decisions—can revolutionize semiconductor manufacturing. Explore its role in process control (FDC, APC), virtual metrology, predictive maintenance, and more. This workshop, aligned with SEMI Smart Manufacturing's roadmap, offers insights into AI-driven factory optimization. Ideal for semiconductor manufacturing professionals, AI enthusiasts, and business leaders seeking to leverage Agentic AI for a competitive edge.

Learn more

MAXIMIZE YOUR EXPOSURE: ADVERTISE YOUR COMPANY IN THIS NEWSLETTER NOW!

Are you interested in advertising in the SEMI Smart Manufacturing Quarterly Newsletter? With an impressive open rate and a remarkably targeted readership, this medium presents an outstanding and cost-efficient means of engaging with your audience. Submitting an advertisement is hassle-free. For more details, please contact Eric Rude at erude@semi.org.

Questions? [Start here.](#)

Do you have a colleague who would be interested in receiving future newsletters? [Please share!](#)

Join the Interest List